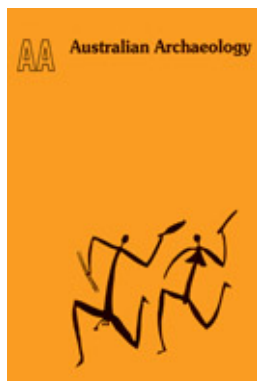


## Australian Archaeology



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### Full Citation Details:

Ingelman-Sundberg, C. 1976. The V.O.C. Ship 'Zeewijk' 1727 report on the 1976 survey of the Site. 'Australian Archaeology', no.5, 18-33.

## THE V.O.C. SHIP 'ZEEWIJK' 1727

### REPORT ON THE 1976 SURVEY OF THE SITE

#### Introduction

The Dutch East Indiaman 'Zeewijk', which foundered in 1727, is the youngest of five East Indiamen known to have been wrecked off the Western Australian coast. So far a full scale excavation has been carried out on the 'Vergulde Draeck' sunk in 1656 and three seasons of excavation have been completed on the 'Batavia' sunk in 1629. The 'Vergulde Draeck' and 'Batavia' projects have mainly involved work in heavy Australian surf conditions and specialised techniques and methods had to be used to overcome these problems.

Work on the 'Zeewijk' wreck involves the same type of difficulties. However, in addition to being exposed to heavy surf, breakers and strong currents, the 'Zeewijk' site has specific survey problems. These are:

- (a) accurately plotting and surveying a site 4 km off the nearest land; and
- (b) accurately plotting and mapping wreck debris underwater which have spread over an area of several kilometres.

As survivors from the wreck spent 8 months on a nearby island, part of the 'Zeewijk' project also involves land survey and land excavation.

This paper deals with the different types of work carried out on the 'Zeewijk' site: the hydrographic survey, and the surveys and excavations both on land and underwater. It is hoped that the different techniques and methods used to overcome the problems involved might be of use to others working in similar situations.

#### The Historical Background

The 'Zeewijk' was built in 1725. It was a Zeeland ship of 140 lasten<sup>1</sup>, 145 feet long and 36 feet<sup>2</sup> wide. It carried 36 iron and bronze guns and 6 swivel guns.<sup>3</sup> The 'Zeewijk' was part of the Dutch East India Company fleet which left the Netherlands in the autumn of 1726 bound for Batavia, Java. The skipper was Jan Steyns from Middleburg and on board were 208 seamen and soldiers. Only one man out of three would ever see Holland again.

## The Disaster

The 'Zeewijk's' fate was partly due to an unfortunate decision made by the skipper, Jan Steyns. Against the protests of the steersman and contrary to the very strict orders of the directorate of the company,<sup>4</sup> Jan Steyns decided to steer ENE... 'in order to, if feasible, call at the land of Eendracht' (Western Australia). The change of course took the 'Zeewijk' perilously close to the Australian coast and the result was the loss of the ship.

At 7.30 pm on 9 June 1927, the ship met its doom. It crashed with full force upon the northern edge of Half Moon Reef in the Houtman Abrolhos only 40 miles from the mainland. The lookout, who had been sitting on the foreyard, had seen the surf for at least half an hour, but had mistaken it for reflections caused by the sky or moon. Unlike the other East Indiamen which foundered off the Western Australian coast, the 'Zeewijk' was not an immediate loss. Despite the high seas that constantly kept pounding the ship, it did not break up immediately or soon after it had struck. This saved the crew from a certain death in the strong currents and the breakers on the reef.

For over a week a heavy swell kept washing over the ship before the crew finally managed to launch the long boat. With the long boat most of the crew were able to come through the surf and save themselves upon nearby Gun Island, situated 4 km from the reef. It is a flat, limestone island with scrub vegetation and rocky and sandy beaches. Here, and on nearby islands, the castaways could get fresh water, edible vegetables<sup>5</sup> and catch birds and seals.<sup>6</sup> From the ship barrels and cases of meat and bacon, breads, butter, brandy, wine, cheese and other victuals were collected and taken to Gun Island.<sup>7</sup> Soon after the camp was organised, the long boat was put in order and a group of 11 of the best seamen under the command of the 1st Officer, Peter Langeweg, set sail for Batavia. But no help was to come, and the long boat was never heard of again.

## The Ship 'Sloepie'

On 29 October, the ship's log for the first time mentions the castaways' intention to build a vessel for their rescue. In March, 5 months later, they set sail in a 20 m long and 6 m wide sloop they built out of the timbers from the 'Zeewijk' wreck. After a month's journey to Java, 82 out of a crew of 208 men that had left Holland one and half years earlier finally arrived at Batavia.

## The Discovery of the 'Zeewijk'

In 1840 relics from the 'Zeewijk' survivors' camp site were found and during the guano industry in the 1880's and 1890's a large amount of 'Zeewijk' material was recovered. The guano diggers dug over the whole island, except for a narrow strip of sand dunes at the western and northern ends of the island, recovering, among other things, bottles, coins, wine glasses, jars, pots, knives, spoons, musket and cannonballs, tobacco boxes and clay pipes. Most of the artefacts were taken care of by the Perth Museum, while some got into the hands of private individuals.<sup>8</sup>

## Various Expeditions to Gun Island

During the 1960's, three recorded expeditions were organised to search for the 'Zeewijk' wreck. Whilst searching for the main wreck site, these expeditions often carried out random digging on Gun Island and casual diving in the shallows. There are no or little records of what was found and which areas were searched during these occasions. Cannon, conglomerates and wreck debris were spotted on the inside reef and, in some cases, raised, but the main wreck remained undiscovered. Finally, in 1968, the author and journalist, Hugh Edwards, managed to locate the 'Zeewijk' main site on the outside reef.

## The Wreck Site

The wreck of the 'Zeewijk' lies at 28° 53.1' S. and 113° 78.8' E. It is scattered over the outside and the inside of Half Moon Reef. The main wreck site lies on the outside, but wreck material, including cannon, have been washed over the reef into the shallows. Inside the reef there are four different wreck material concentrations containing cannon, timbers, part of the rigging and remains of what might have been part of the cargo.

## The 1976 'Zeewijk' Expedition

The 1976 expedition was divided into 4 main projects:

1. Hydrographic Survey: To accurately plot the 'Zeewijk' main site and wreck material concentrations on the inside reef, using a theodolite and sextants.
2. Underwater Survey: To record and survey the wreck site and the extent and pattern of wreck material washed over the reef.

3. Land Survey: To map Gun Island's topographical features as well as any area of archaeological potential and interest.

4. Land Excavation: To dig test holes 1 x 1 m at 10 m intervals at the western part of the island in order to try and locate the 'Zeewijk' survivors' camp sites.

Additional projects:

1. Locate wreck debris of another Dutch shipwreck to which the 'Zeewijk' survivors referred in their ship's log.
2. To investigate guano diggers' activities in the area during the late 19th century.

These two latter aspects of the expedition, as well as problems concerning contamination of 18th and 19th century material recovered in the area are to be published separately by G. Henderson.

## I. Hydrographic Survey

The main problem when surveying the 'Zeewijk' site was to find and plot accurately the different areas where wreck material had been scattered. 'Zeewijk' material was found, not only all the way from the reef to Gun Island, a distance of 4 km, but also on the island itself where the castaways once had their camp sites. To get a satisfactory picture of the extent, the correlation and location of the different areas of interest, the areas of wreck material were surveyed and plotted on a map. These areas were then surveyed accurately so they could be related to the national mapping survey mark station NMF/635.

A baseline was established on Gun Island which served to locate both the land excavation areas and underwater survey areas. The underwater survey areas were located in relation to accurate reference points at sea. The underwater survey areas were then located in relation to these reference points, which in turn were located with reference to the baseline on Gun Island. The reference points consisted of six starpickets with flags on the end of bamboo canes attached to the pickets and were placed on the reef and in the shallows (Fig.1). Three starpickets were hammered into the reef in a line at a distance of 280 m apart, while the other three starpickets were placed 280 and 330 m from each other in the shallow water inside the reef 350 m and 90°

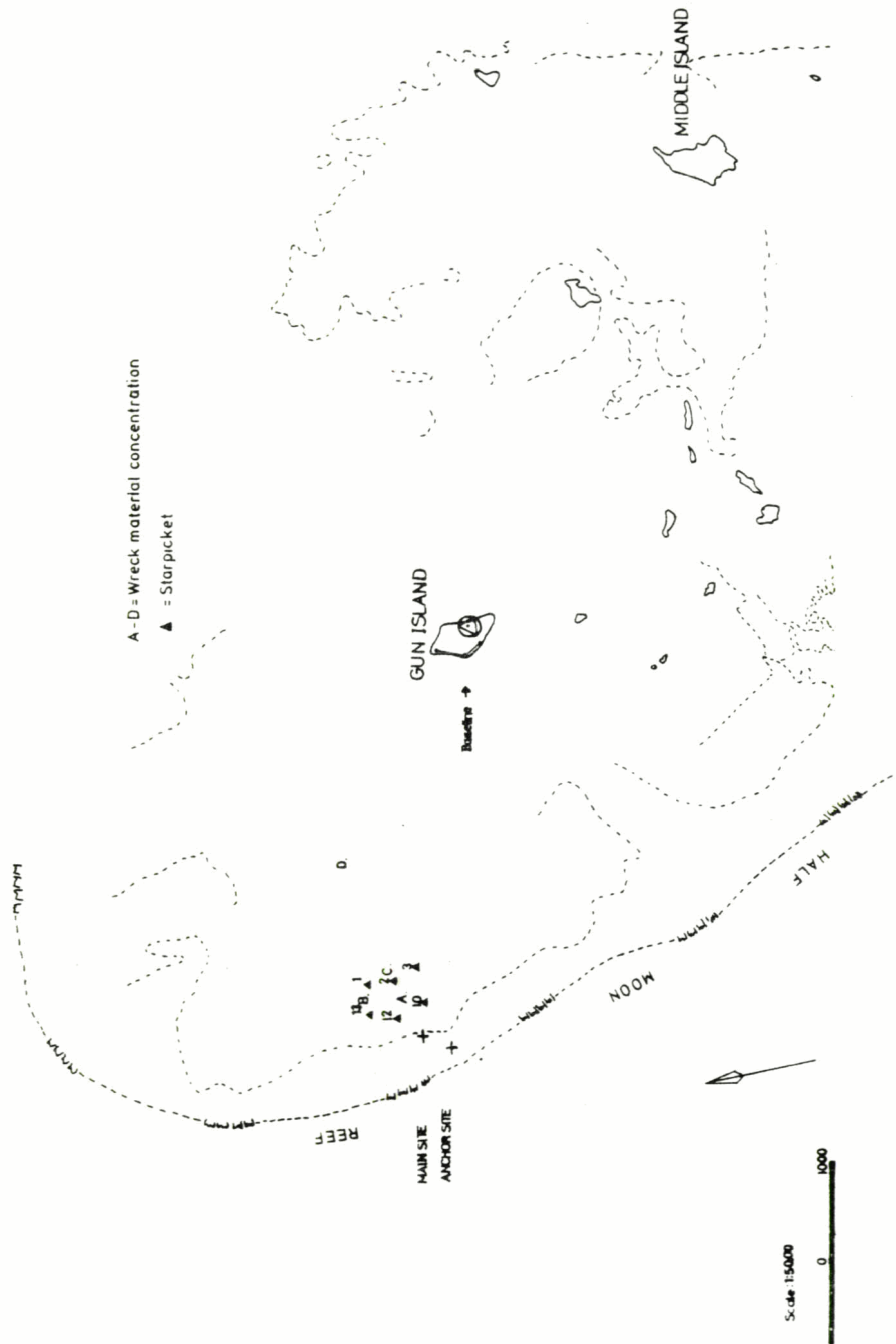


Fig.1. The 'Zeewijk' site and Gun Island mapped on the Australian Admiralty Chart. The reference points for the underwater survey (the starpickets) and the wreck material concentrations are marked on the inside of Half Moon Reef

east of the first line of markers. In this way the lines of starpickets formed a rectangle where each starpicket on the reef faced one in the shallows. Using a theodolite and the baseline on Gun Island, the starpickets were then accurately positioned and plotted in relation to the island and the reef. Having these fixed reference points at sea, wreck material in the area could be located by using sextants on any of the six starpickets.

## II Underwater Survey

Underwater surveys were carried out both on the inside and outside of Half Moon Reef. On the inside, the work involved swimline searches and separate surveys of different areas with wreck material concentrations. On the outside, a brief survey of the main site was accomplished.

### A. *Swimline search*

Swimline searches on the inside reef were carried out in order to establish the extent and pattern of the wreck debris washed over the reef. By determining the distribution of the material found, it was hoped to get a picture of the possible deterioration of the ship. Thus it was required that each find was plotted on a plan of the area with an accuracy of approximately  $\pm 0.5$  m. The following survey technique was used:

Using an underwater theodolite, 50 x 50 m areas were laid out on the bottom with the area bounded by the six starpickets. At the surface, the areas were marked out with buoys; these areas were then located by taking sextant angles from the buoys to the reference points (starpickets). On the seabed, 2 measuring tapes, one running from east to west and the other from north to south, marked two of the sides of the 50 x 50 m square to be searched. The east-west tape was selected as a baseline and a third measuring tape was laid out 25 m from, and parallel to, this east-west line, dividing the square in two 25 x 50 m survey areas.

Two divers, with a writing board and collecting bags, formed a swimline team. The divers swam parallel to each other holding a measure line between them. One diver swam up and down the baseline keeping the zero point of the measure line on the baseline, while the other diver, who did the searching, swam corresponding search tracks at 2 m intervals. Starting 2 m from the baseline, the searching diver swam his next track at 4 m, then at 6 m, etc. When an artefact was found, its coordinates could immediately be established. The position of the zero point of the diver's tape on the baseline gave the x coordinate; the y coordinate was then the distance between the divers given by the diver's tape.

Obviously, the divers had to keep the measuring tape taut, and its length could not exceed 13 m due to the difficulty of keeping the line taut. The measuring tape at 25 m was used as a second baseline when the first 13 x 50 m area was finished. The diving team would move to this line and search the 13 x 50 m 'left over area' south of it. When the 25 x 50 m area was completed, the first baseline was moved 25 m north of the second baseline. Thus a new 25 x 50 m searching area was created, and the search could continue. This search technique was adequate for any number of diving teams as the number of areas could be adjusted to the number of divers available. It was also a simple and easy technique for the divers to pick up.

The underwater survey was carried out over a 50 x 400 m large area and terminated when there was no wreck material to be found on either side of the search area.

Result of the swimline search: As a result of the swimline search, it was possible to determine the extent of the area where wreck material had been washed over the reef. In the 50 x 400 m area searched, the 300 m wide area in the middle yielded 510 fragments of glass, pottery, bricks and metal.

The extent of different material varied in different areas (Fig.2). At this stage of investigation, it is difficult to explain the reasons for this distribution. However, it is obvious that before any complete analysis can be done, the wreck site on the outside reef has to be fully investigated. Also, consideration has to be given to currents and the structure of the bottom in the area between the main site and in the underwater survey area. In addition, the shape and weight of the different wreck material involved have to be examined.

#### *B. Survey of wreck material concentrations*

Wreck debris was found within the underwater survey area as well as between this area and Gun Island. So far, four major wreck material concentrations have been recorded on the inside reef. The areas are marked A to D (Fig.1). All these areas were surveyed with triangulation and/or an underwater theodolite. In addition, the areas were documented on sketches and photographs.

Area A contains two single iron cannon surrounded by broken glass from wine bottles, a few iron items and a small number of ceramic pieces. This material lay at a depth of 1-2 m on a mainly flat and sandy bottom. The area has since long been known to fishermen and divers and has been subject to collection. In Area B, 1 iron cannon, 7 kegs of nails and





▲ 1  
▲ 2  
▲ 3

Fig.2. Distribution of artefacts recovered during the underwater survey

2 concentrations of iron bars have been located. The wreck material is situated in about 1-1.5 m of water on a hard limestone and coral bottom. The area was surveyed with an underwater theodolite. A test excavation in the area did not reveal any further finds. Area C located during the 1976 expedition contains another iron cannon, iron hooks, chain plates, part of a mast cap, and a lot of broken glass and ceramics. The items lay loose on a sandy bottom in about 1.5-2 m of water. The area was located as a result of a swimline tow that followed the traces of iron wreckage which had been plotted in the underwater survey area.

The iron hooks were found in the near vicinity of the cannon and might have been the hooks which once held the gun-carriage in place on deck. It is interesting to note that within 30 m of the cannon there are chain plates and timber. Also, the glass and ceramic found in the area is in a much better state of preservation than elsewhere on the inside reef. The fragments found are generally twice the size and sometimes even bigger than fragments found in the underwater survey area. Furthermore, the area yields wine glasses and a lot of ceramics; finds which were only occasionally found in the other areas. This suggests the possibility that a section of the ship might have broken loose from the wreck site, drifted over the reef and finally came to settle in this area. A further investigation of the area which might or might not support this theory is planned for a forthcoming expedition.

Area D, lies in 2-4 m of water on a sandy bottom surrounded by coral 3.2 km from the reef. In this area, only parts from the rigging and timbers have been found. Visible, and partly buried in the sand, were 6 pieces of timber, chain plates and iron conglomerates. The area was mapped with triangulation and with the help of an underwater theodolite. A test excavation was also carried out in order to find out whether the sand covered any sections or upper structure of the ship which might have broken loose from the main site on the outside reef. Approximately 20 m<sup>3</sup> of sand was removed with the help of a water dredge, but no further finds were made.

Results of the underwater survey of wreck material concentrations: During the 1976 'Zeewijk' expedition, areas A, B and D were fully documented. Area C, located on one of the last days of the expedition, has only been preliminarily investigated. A careful underwater survey of the same type that was carried out in the starpicket area would be of value here. By plotting each artefact recovered, it might be possible to draw some conclusions concerning the pattern and composition of the

wreck material found. Also a test excavation would be of interest, as the sand might yield ship structure supporting the theory that a section of the ship might have come to settle here.

### C. *Survey of the 'Zeewijk' main site*

As has been pointed out before, the rough conditions of the 'Zeewijk' site make any survey of the wreck an extremely difficult task. Out of 39 diving days, it was only possible to work the site on two days, and even then it was a hard task to do any sensible work as the breakers throw the divers backwards and forwards over several metres. Two buoys were placed on the outside reef, one on what is assumed to be the main site and the other on an area containing cannon and anchors. The position of the buoys were taken with a theodolite placed on the reef. The theodolite was related to the survey control stations on the reef (the starpickets) which thence were related to the survey station on the island. In this way the wreck site could be accurately plotted in relation to the island, the wreck material concentrations and the underwater survey areas. A triangulation was carried out on the main site area, whereas conditions never were satisfying for a survey in the anchor area. Photographic recording was carried out in both areas.

Result of the survey of the main site: The triangulation of the main site resulted in a preliminary sketch of the area showing 12 cannon (Fig.3).

In the anchor area, 7 cannon and 2 anchors were located. Between the two main site areas and the highest point of the reef, there are more anchors and cannon laying about on the flat limestone bottom. Except for wreck debris trapped around the cannon, there is no appearance of other wreck material. It is not yet clear whether wreck debris has been buried in the bottom or in the few coral patches in the area. On the next expedition to the site, it is hoped that a further investigation and survey of the area can be accomplished.

### III Land Survey

The land survey served the following purposes:

1. To accurately map Gun Island whereby topographical features, areas of archaeological interest, extent of non-mined areas, rubble piles, hut foundations, posts, wells, etc., would be noted.

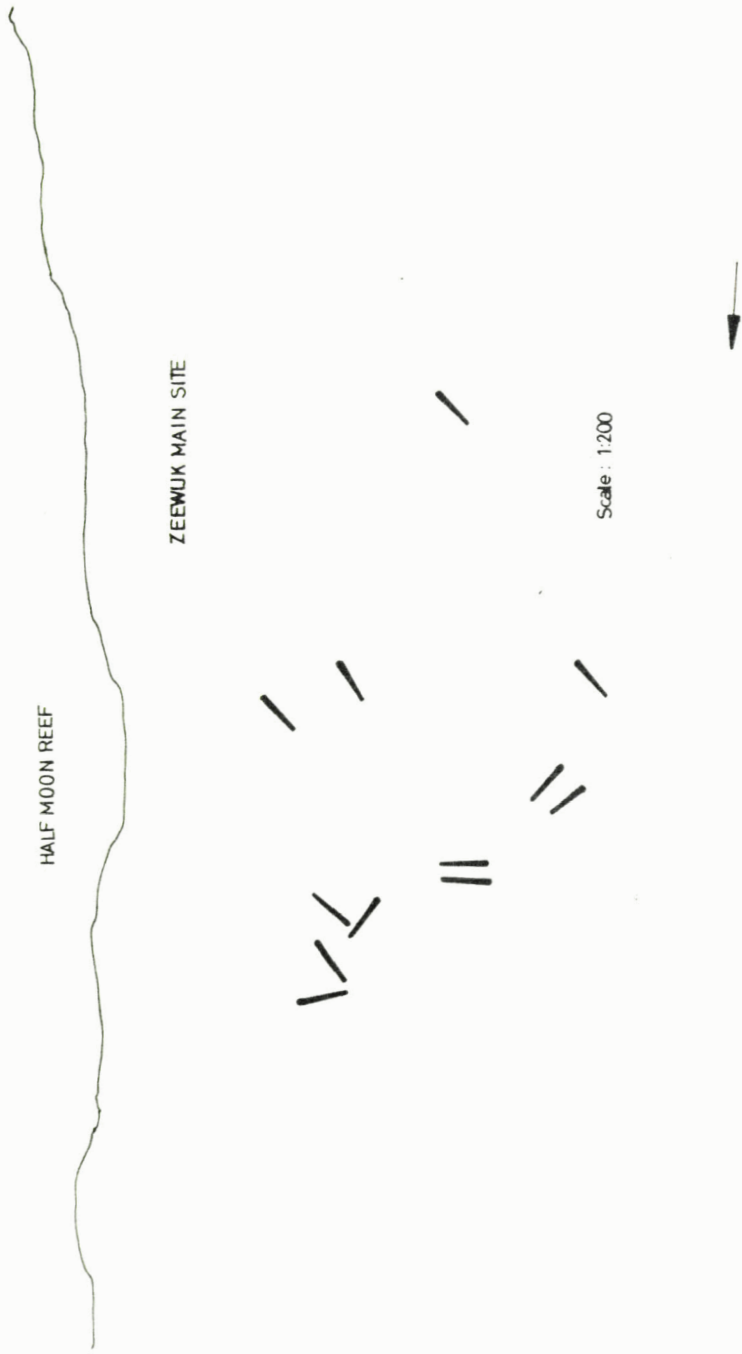


Fig. 3. A preliminary sketch of the 'Zeewijk' main site area, showing distribution of cannon

2. To establish an accurate baseline on the island in order to:
  - (a) position archaeological land excavation sites;
  - (b) control accurate reference points at sea for the underwater survey;
  - (c) position the 'Zeewijk' site on the outside reef.

Two baselines were laid out on Gun Island. One ran from Mutton Bird Hill to Lunch Point. The other from Lunch Point to Point Happy (Fig.4). These lines were orientated to the national mapping survey station on the island (NMF/635) and marked every 50 m. Azimuth was brought into the network by relating the NMF/635 station to the mapping station NMF/634 situated on a nearby island, Post Office Island.

A more detailed report on the land survey and the work carried out in connection with the mapping of the island will be published separately by J. Willis. Here it serves to say that the main result of the work was the final map of Gun Island shown in Fig.4. As a result of the land survey, it was possible to accurately plot the wreck site, the main areas of wreck concentrations and the underwater survey areas on the Australian Admiralty Charts (Fig.1). A Wild TIA Double Centre Theodolite was used for the readings.

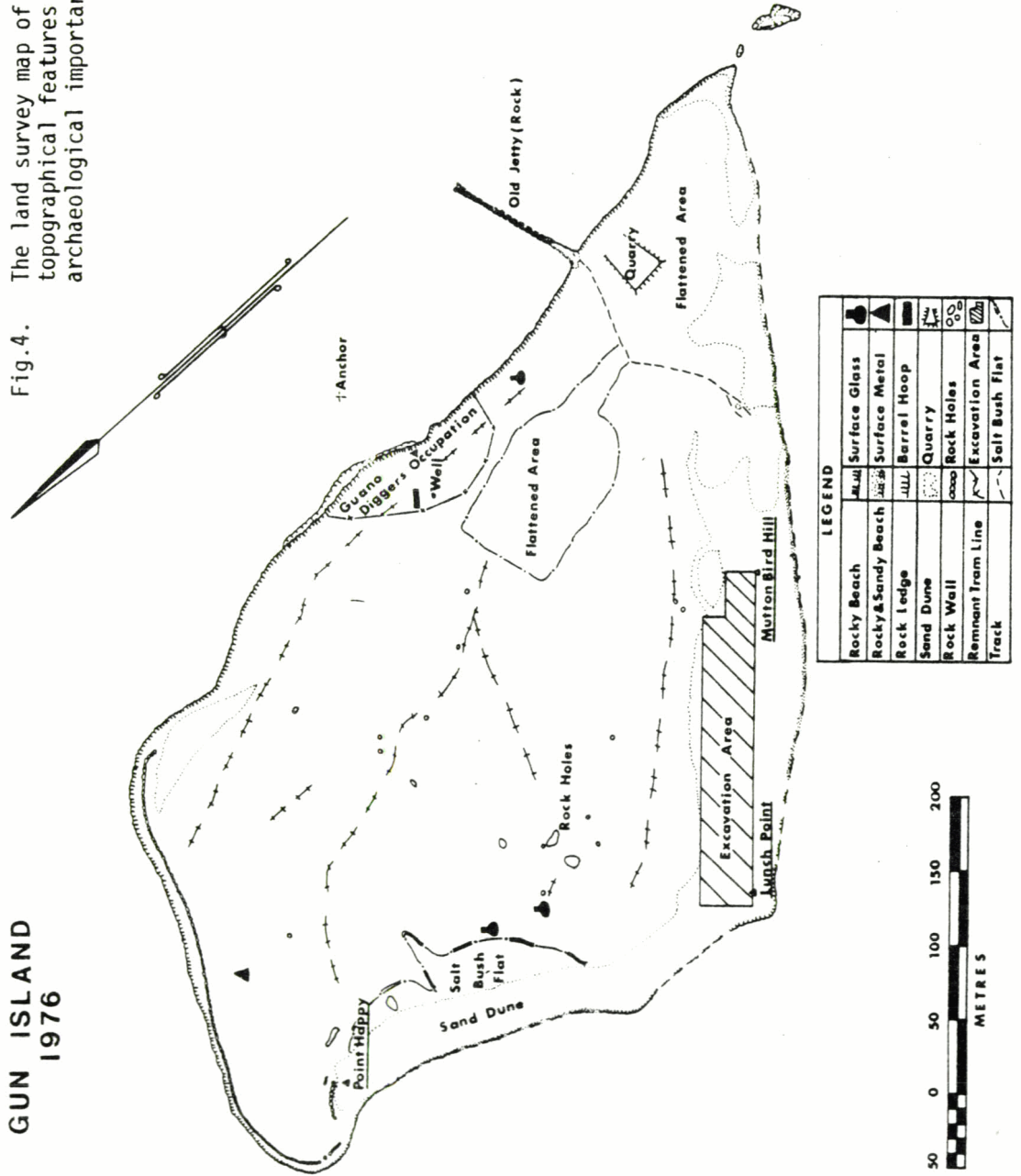
#### IV Land Excavation

In the 19th century, the guano diggers left only a narrow strip at the other edge of the western and northern end of the island undug. However, here among the scrub and sand dunes, 18th century material such as fragments of wine bottles, iron hoops and clay pipes were frequently found. Thus the area became a popular digging spot for a number of individuals looking for 'treasure' and evidence showing the location of the 'Zeewijk' camps disappeared. In order to try and relocate the 18th century camp sites, it was decided to carry out a systematic excavation of the area.

A line of 23 test holes was dug at 10 m intervals on the baseline running south to north between Mutton Bird Hill and Lunch Point. A series of 2-3 test holes was then dug at 10 m intervals east of this line. The test holes were 1 x 1 m and varied between 60-100 cm in depth depending on the ground structure. Artefacts found were registered with their x, y and z coordinates and the archaeological stratas in which they were found were noted. A complete report on

**GUN ISLAND  
1976**

Fig. 4. The land survey map of Gun Island where topographical features and areas of archaeological importance were mapped



the land excavation and the archaeological problems involved in this work will be published separately by J.N. Green. Here it serves to say that 89 test holes were dug over an area of 920 m<sup>2</sup>. Of these 56 holes were sterile and 33 holes possibly indicate the location of three camp sites. The aim is to continue the test hole excavation at the northern end of the island and then, on the basis of the result from the test excavations, prolong with full scale land excavation in the presumed camp site areas.

## Conclusions

The 'Zeewijk' wreck is not an outstanding wreck find. Being one of 18 Dutch East Indiamen found so far, it is not particular for its origin nor for the time it represents. However, here lies also one of the assets of the wreck. It serves for important comparative studies of artefacts in the early 18th century. Characteristic for the work on the 'Zeewijk' site are the difficulties involved in surveying the wreck. However, the 1976 'Zeewijk' expedition showed for the first time, that it is possible to survey and plot the 'Zeewijk' site which has been scattered over several kilometres at distances up to 4 km to the nearest land. With the help of a land based theodolite, markers (the tarpickets) and sextants, all wreck finds of importance being accurately located on Australian Admiralty Charts.

The 1976 'Zeewijk' expedition has shown that there is little opportunity to carry out any major work on the main site on the outside reef; two thirds of the main site area still remain to be surveyed. The various cannon and anchors could be marked with buoys and plotted, and the main concentrations of wreck material triangulated. However, a full scale excavation in the area would be an extremely difficult operation and only possible on an average of approximately two days per month. The inside reef area has so far been a limited source for archaeological material and only fragments of glass, ceramic and metal have been found. However, at least another 1200 m<sup>2</sup> remain to be surveyed on the inshore reef before the underwater survey can be considered complete. The land excavation unearthed what might have been the remains of three camp sites. A full scale land excavation is planned in these areas in order to investigate the archaeological potential of the sites. In addition, another series of test holes at the northern and southern ends of the island remain to be dug in order to locate what is assumed to be other camp site areas.

At this stage of investigation, it is estimated that another 9-12 months of field work is needed for the completion of the 'Zeewijk' project.

## Footnotes

- 1 A 'last' was 1.97 tonnes
- 2 One Amsterdam foot was 0.2831 m
- 3 Register of ships departed from Holland to the Dutch East Indies (ARA, Kol, Arch. 4390, nr. 64)
- 4 No.20 Letter of Governor General and High Council of the Dutch East Indies to Gentlemen XVII, Batavia, October 31, 1978 (ARA, Kol, Arch 1974 OB 1729 1 fol 8 vxo - 14)
- 5 *Ibid*
- 6 C. de Heer: The wreck of the East Indiaman 'Zeewijk' at the Abrolhos Islands in the year 1927. A translation of the ship's journal with a short introduction and notes
- 7 *Ibid*
- 8 Broadhurst, MacNeil and Co. Letter to the Hon. Secretary, Royal Geographical Society of Australasia, 1897

## Acknowledgements

The author is indebted to numerous people for their help and assistance in this project. Firstly, I would like to thank N. Green for his hard and unselfish work and encouraging support during the expedition. I am also indebted to the Western Australian Museum's Maritime Archaeology staff, P. Baker, G. Henderson, W. Robinson, M. Stanbury and L. Zuiderbaan, for their advice and assistance. Thanks are also due to C. Powell, K. Young and R. Stannard who helped in the preparations for the expedition.

The help and assistance of the Maritime Archaeology Association were very much appreciated and I would like to thank M. Pollard, G. Green, W. Marshall, D. Ryan, J. Wilson P. McGregor, C. Groen, T. Rechner, J. Gambold, P. Howden and M. Fane for the great amount of work they put into the project. I am grateful for the assistance from the finder of the wreck, H. Edwards, who familiarised the expedition with the wreck site and the islands. I am also indebted to the support and help of J. Willis, who carried out the survey of the island. Thanks are also due to C. Burns at the Geraldton Maritime Museum and to the fishermen on the islands,



in particular M.Glazier. The author would like to thank J. Lillburn and the crew on 'Freycinet', A. Feaorenze and the crew of the carrier boat 'Southern Lady', M. Cramer and the Coastal Radio Station VIN Geraldton for their assistance during the expedition. The 'Zeewijk' project was sponsored by an Australian Research Grants Committee grant.

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AUSTRALIAN GROUND STONE HATCHETS:  
THEIR DESIGN AND DYNAMICS

Abstract

The general purpose tool of the Australian Aborigines, usually known as a stone axe, is more correctly termed a hatchet since it conforms to the design requirements of a tool made for one-handed use. Similar implements not so conforming appear to be special purpose tools.

A geometrical feature common to all these tools and perhaps to other types is the 'median plane' which determines the position of the edge and governs some of its operational properties.

Some dynamical features of stone hatchet heads, the design of handles for them and their security of mounting are examined and compared with the features of modern steel hatchets.

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